Pote
21/09/21

Neeraj Appan

AppAs

SDS Page No.
Date / /

AI Practical No 9

Aim: Implement Naive Bayes learning algorithm for the restaurant waiting problem

Algorithm -

1) Start
2) Make data set of R.W.P
3) Implement Naive Bayes learning Algorithm
4) Define function 'fit'
5) Define function 'get Probab' In this get probability of R.W.P
6) Define Main function. In this and print resultant values
7) Stop.

aip9.py - E:\fffiiles\college pracs and projects\AI\aip9.py (3.8.3)

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```
#AIM: Implement Naive-Bayes learning algo for RWP(Restaurant Waiting Problem).

print("Neeraj Appari T073\n")


rwp_examples = dict(
    x1=dict(Alt='Y', Bar='N', Fri='N',Hun='Y',Pat='S',Price='$$$',Rain='N',Res='Y',Type='F',Est='0-10',ans='Y'),
    x2=dict(Alt='Y', Bar='N', Fri='N',Hun='Y',Pat='F',Price='$',Rain='N',Res='N',Type='T',Est='30-60',ans='N'),
    x3=dict(Alt='N', Bar='Y', Fri='N',Hun='N',Pat='S',Price='$',Rain='N',Res='N',Type='B',Est='0-10',ans='Y'),
    x4=dict(Alt='Y', Bar='N', Fri='Y',Hun='Y',Pat='F',Price='$',Rain='Y',Res='N',Type='T',Est='10-30',ans='Y'),
    x5=dict(Alt='Y', Bar='N', Fri='Y',Hun='N',Pat='F',Price='$$$',Rain='N',Res='Y',Type='F',Est='>60',ans='N'),
    x6=dict(Alt='N', Bar='Y', Fri='N',Hun='Y',Pat='S',Price='$$',Rain='Y',Res='Y',Type='I',Est='0-10',ans='Y'),
    x7=dict(Alt='N', Bar='Y', Fri='N',Hun='N',Pat='N',Price='$',Rain='Y',Res='N',Type='B',Est='0-10',ans='N'),
    x8=dict(Alt='N', Bar='N', Fri='N',Hun='Y',Pat='S',Price='$$',Rain='Y',Res='Y',Type='T',Est='0-10',ans='Y'),
    x9=dict(Alt='N', Bar='Y', Fri='Y',Hun='N',Pat='F',Price='$',Rain='Y',Res='N',Type='B',Est='>60',ans='N'),
    x10=dict(Alt='Y', Bar='Y', Fri='Y',Hun='Y',Pat='F',Price='$$$',Rain='N',Res='Y',Type='I',Est='10-30',ans='N'),
    x11=dict(Alt='N', Bar='N', Fri='N',Hun='N',Pat='N',Price='$',Rain='N',Res='N',Type='T',Est='0-10',ans='N'),
    x12=dict(Alt='Y', Bar='Y', Fri='Y',Hun='Y',Pat='F',Price='$',Rain='N',Res='N',Type='B',Est='0-10',ans='Y')
    )

#from RWP import rwp_examples
total_exp = 12
def tot(attribute, value):
    count = 0
    for key, val in rwp_examples.items():
        for key1, val1 in val.items():
            if key1 == attribute:
                if val1 == value:
                    count += 1
    return count
def getProbab(attribute, attribval, value):
```

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```
    PAnsYes = tot('ans', 'Y') / total_exp
    PAnsNo = tot('ans', 'N') / total_exp
    print('Probability for will wait if there is an Alternate Restaurant Nearby: ')
    print('Yes: Will Wait ', (getProbab('Alt', 'Y', 'Y') * PAnsYes/PAltYes) * 100, '%')
    print('No: Will Wait ', (getProbab('Alt', 'Y', 'N') * PAnsNo/PAltYes ) * 100, '%')
    print('Probability for will wait if there No is an Alternate Restaurant Nearby: ')
    print('Yes: Will Wait ', (getProbab('Alt', 'N', 'Y') * PAnsYes/PAltNo) * 100, '%')
    print('No: Will Wait ', (getProbab('Alt', 'N', 'N') * PAnsNo/PAltNo) * 100, '%')
    print('Probability for will wait if Estimated Wait time is 0-10 minutes: ')
    print('Yes: Will Wait ', (getProbab('Est', '0-10', 'Y') * PAnsYes/PEstFew) * 100, '%')
    print('No: Will Wait ', (getProbab('Est', '0-10', 'N') * PAnsNo/PEstFew) * 100, '%')
    print('Probability for will wait if Estimated Wait time is 10-30 minutes ')
    print('Yes: Will Wait ', (getProbab('Est', '10-30', 'Y') * PAnsYes/PEstMore) * 100, '%')
    print('No: Will Wait ', (getProbab('Est', '10-30', 'N') * PAnsNo/PEstMore) * 100, '%')
    print("Probability for Will Wait if the Estimated Wait Time is 30-60 mins: ")
    print("Yes: Will Wait: ",(getProbab('Est','30-60','Y')*PAnsYes/PEstStillMore)*100,"%")
    print("No: Will Wait: ",(getProbab('Est','30-60','N')*PAnsNo/PEstStillMore)*100,"%")
    print("Probability for Will Wait if the Estimated Wait Time is >60 mins: ")
    print("Yes: Will Wait: ",(getProbab('Est','>60','Y')*PAnsYes/PEstTooMuch)*100,"%")
    print("No: Will Wait: ",(getProbab('Est','>60','N')*PAnsNo/PEstTooMuch)*100,"%")
    print('Probability for will wait if there are Some Patrons ')
    print('Yes: Will Wait ', (getProbab('Pat', 'S', 'Y') * PAnsYes/PPatSome) * 100, '%')
    print('No: Will Wait ', (getProbab('Pat', 'S', 'N') * PAnsNo/PPatSome) * 100, '%')
    print("Probability for Will Wait if there are None Patrons: ")
    print("Yes: Will Wait: ",(getProbab('Pat','N','Y')*PAnsYes/PPatNone)*100,"%")
    print("No: Will Wait: ",(getProbab('Pat','N','N')*PAnsNo/PPatNone)*100,"%")
    print("Probability for Will Wait if there are Full Patrons: ")
    print("Yes: Will Wait: ",(getProbab('Pat','F','Y')*PAnsYes/PPatFull)*100,"%")
    print("No: Will Wait: ",(getProbab('Pat','F','N')*PAnsNo/PPatFull)*100,"%")
    print('Probability for will wait if the place is Thai ')
    print('Yes: Will Wait ', (getProbab('Type', 'T', 'Y') * PAnsYes/PTypeThai) * 100, '%')
    print('No: Will Wait ', (getProbab('Type', 'T', 'N') * PAnsNo/PTypeThai) * 100, '%')
```

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```
    print('Yes: Will Wait ', (getProbab('Alt', 'Y', 'Y') * PAnsYes/PAltYes) * 100, '%')
    print('No: Will Wait ', (getProbab('Alt', 'Y', 'N') * PAnsNo/PAltYes ) * 100, '%')
    print('Probability for will wait if there No is an Alternate Restaurant Nearby: ')
    print('Yes: Will Wait ', (getProbab('Alt', 'N', 'Y') * PAnsYes/PAltNo) * 100, '%')
    print('No: Will Wait ', (getProbab('Alt', 'N', 'N') * PAnsNo/PAltNo) * 100, '%')
    print('Probability for will wait if Estimated Wait time is 0-10 minutes: ')
    print('Yes: Will Wait ', (getProbab('Est', '0-10', 'Y') * PAnsYes/PEstFew) * 100, '%')
    print('No: Will Wait ', (getProbab('Est', '0-10', 'N') * PAnsNo/PEstFew) * 100, '%')
    print('Probability for will wait if Estimated Wait time is 10-30 minutes ')
    print('Yes: Will Wait ', (getProbab('Est', '10-30', 'Y') * PAnsYes/PEstMore) * 100, '%')
    print('No: Will Wait ', (getProbab('Est', '10-30', 'N') * PAnsNo/PEstMore) * 100, '%')
    print("Probability for Will Wait if the Estimated Wait Time is 30-60 mins: ")
    print("Yes: Will Wait: ",(getProbab('Est','30-60','Y')*PAnsYes/PEstStillMore)*100,"%")
    print("No: Will Wait: ",(getProbab('Est','30-60','N')*PAnsNo/PEstStillMore)*100,"%")
    print("Probability for Will Wait if the Estimated Wait Time is >60 mins: ")
    print("Yes: Will Wait: ",(getProbab('Est','>60','Y')*PAnsYes/PEstTooMuch)*100,"%")
    print("No: Will Wait: ",(getProbab('Est','>60','N')*PAnsNo/PEstTooMuch)*100,"%")
    print('Probability for will wait if there are Some Patrons ')
    print('Yes: Will Wait ', (getProbab('Pat', 'S', 'Y') * PAnsYes/PPatSome) * 100, '%')
    print('No: Will Wait ', (getProbab('Pat', 'S', 'N') * PAnsNo/PPatSome) * 100, '%')
    print("Probability for Will Wait if there are None Patrons: ")
    print("Yes: Will Wait: ",(getProbab('Pat','N','Y')*PAnsYes/PPatNone)*100,"%")
    print("No: Will Wait: ",(getProbab('Pat','N','N')*PAnsNo/PPatNone)*100,"%")
    print("Probability for Will Wait if there are Full Patrons: ")
    print("Yes: Will Wait: ",(getProbab('Pat','F','Y')*PAnsYes/PPatFull)*100,"%")
    print("No: Will Wait: ",(getProbab('Pat','F','N')*PAnsNo/PPatFull)*100,"%")
    print('Probability for will wait if the place is Thai ')
    print('Yes: Will Wait ', (getProbab('Type', 'T', 'Y') * PAnsYes/PTypeThai) * 100, '%')
    print('No: Will Wait ', (getProbab('Type', 'T', 'N') * PAnsNo/PTypeThai) * 100, '%')
main()
```

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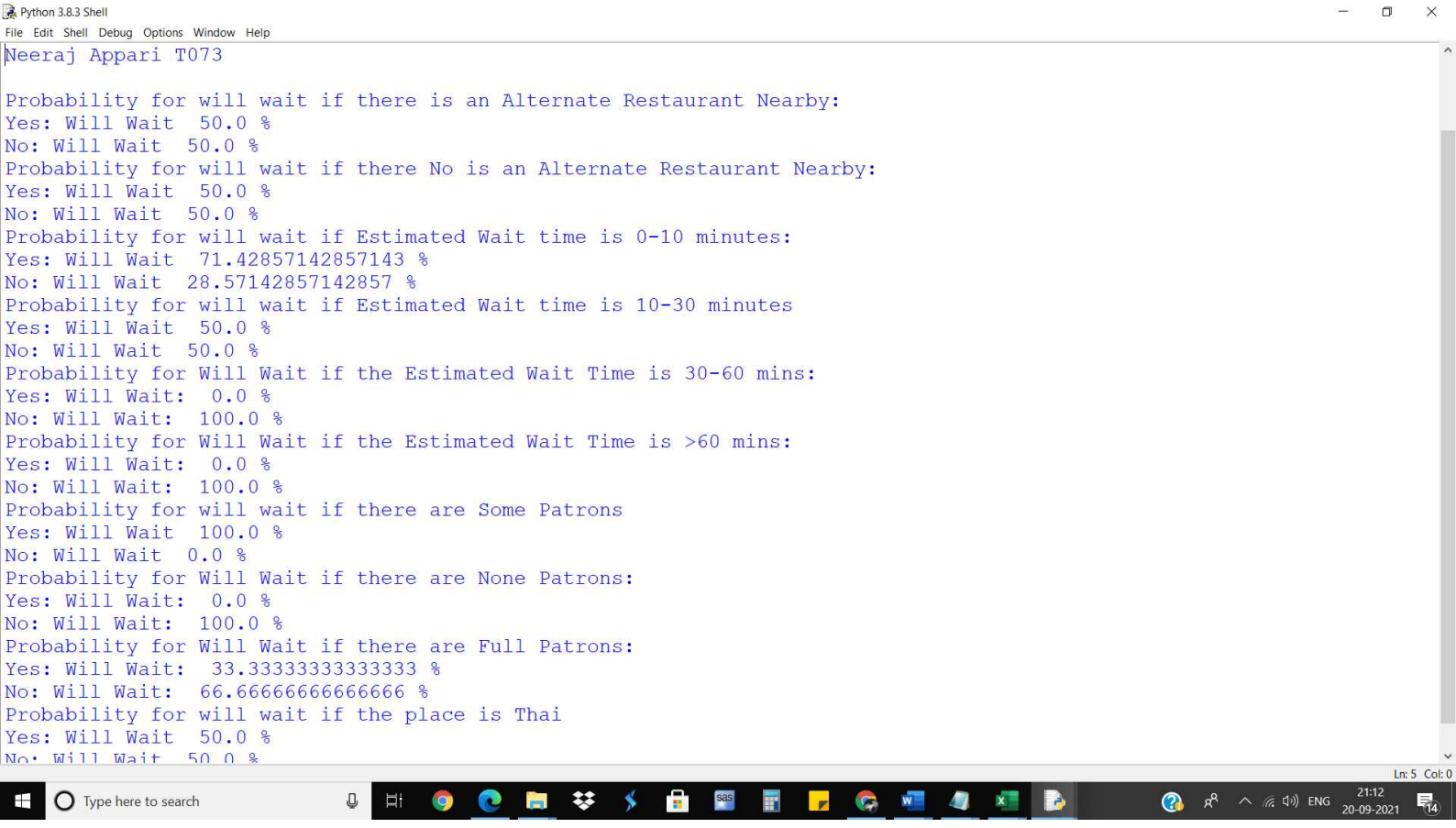
Python 3.8.3 Shell
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Neeraj Appari T073
Probability for will wait if there is an Alternate Restaurant Nearby:
Yes: Will Wait 50.0 %
No: Will Wait 50.0 %
Probability for will wait if there No is an Alternate Restaurant Nearby:
Yes: Will Wait 50.0 %
No: Will Wait 50.0 %
Probability for will wait if Estimated Wait time is 0-10 minutes:
Yes: Will Wait 71.42857142857143 %
No: Will Wait 28.57142857142857 %
Probability for will wait if Estimated Wait time is 10-30 minutes
Yes: Will Wait 50.0 %
No: Will Wait 50.0 %
Probability for Will Wait if the Estimated Wait Time is 30-60 mins:
Yes: Will Wait: 0.0 %
No: Will Wait: 100.0 %
Probability for Will Wait if the Estimated Wait Time is >60 mins:
Yes: Will Wait: 0.0 %
No: Will Wait: 100.0 %
Probability for will wait if there are Some Patrons
Yes: Will Wait 100.0 %
No: Will Wait 0.0 %
Probability for Will Wait if there are None Patrons:
Yes: Will Wait: 0.0 %
No: Will Wait: 100.0 %
Probability for Will Wait if there are Full Patrons:
Yes: Will Wait: 33.33333333333333 %
No: Will Wait: 66.66666666666666 %
Probability for will wait if the place is Thai
Yes: Will Wait 50.0 %
Ln: 5 Col: 0
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